

GAO

Report to the Ranking Member,
Committee on Oversight and
Government Reform, House of
Representatives

September 2007

U.S. PATENT AND TRADEMARK OFFICE

Hiring Efforts Are Not Sufficient to Reduce the Patent Application Backlog





Highlights of [GAO-07-1102](#), a report to the Ranking Member, Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

Increases in the volume and complexity of patent applications have lengthened the amount of time it takes the U.S. Patent and Trademark Office (USPTO) to process them. In addition, concerns have continued about USPTO's efforts to hire and retain an adequate patent examination workforce that can not only meet the demand for patents but also help reduce the growing backlog of unexamined patent applications. In this context, GAO was asked to determine for the last 5 years (1) USPTO's process for identifying its annual hiring estimates and the relationship of these estimates to the patent application backlog; (2) the extent to which patent examiner hiring has been offset by attrition, and the factors that may contribute to this attrition; and (3) the extent to which USPTO's retention efforts align with patent examiners' reasons for staying with the agency. For this review, GAO surveyed 1,420 patent examiners, and received an 80 percent response rate.

What GAO Recommends

GAO recommends that USPTO undertake a comprehensive evaluation of the assumptions that the agency uses to establish its production goals. USPTO generally agreed with this recommendation.

www.gao.gov/cgi-bin/getrpt?GAO-07-1102.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Anu Mittal, 202-512-3841, mittala@gao.gov.

U.S. PATENT AND TRADEMARK OFFICE

Hiring Efforts Are Not Sufficient to Reduce the Patent Application Backlog

What GAO Found

In each of the last 5 years, USPTO primarily identified its projected annual hiring estimates on the basis of available funding levels and its institutional capacity to support additional staff and not on the existing backlog or the expected patent application workload. USPTO's process for identifying its annual hiring estimates is generally consistent with accepted workforce planning strategies. Each year the agency determines how many new patent examiners it has the budget and supervisory and training capacity to hire. However, because this approach does not take into account how many examiners are needed to reduce the existing patent application backlog or address the inflow of new applications, it is unlikely that the agency will be able to reduce the growing backlog simply through its hiring efforts.

Although USPTO is hiring as many new patent examiners as its budget and institutional capacity will support, attrition is offsetting hiring progress, and agency management and patent examiners disagree about the causes for attrition. From 2002 through 2006, one patent examiner left USPTO for nearly every two the agency hired. This represents a significant loss to the agency because 70 percent of those who left had been at the agency for less than 5 years and new patent examiners are primarily responsible for the actions that remove applications from the backlog. According to USPTO management, patent examiners leave the agency primarily for personal reasons, such as the job not being a good fit or family reasons. In contrast, 67 percent of patent examiners identified the agency's production goals as one of the primary reasons examiners may choose to leave USPTO. These production goals are based on the number of applications patent examiners must complete biweekly and have not been adjusted to reflect the complexity of patent applications since 1976. Moreover, 70 percent of patent examiners reported working unpaid overtime during the past year, in order to meet their production goals. Such a large percentage of patent examiners who are working extra time to meet their production goals and would choose to leave the agency because of these goals may be an indication that the production goals do not accurately reflect the time patent examiners need to review applications and is undermining USPTO's hiring efforts.

The retention incentives and flexibilities provided by USPTO over the last 5 years generally align with the primary reasons identified by patent examiners for staying with the agency. Between 2002 and 2006, USPTO used a variety of retention flexibilities such as a special pay rate, performance bonuses, flexible work schedules, and a telework program to encourage patent examiners to stay with the agency. According to USPTO management the most effective retention efforts were those related to compensation and an enhanced work environment. GAO's survey of patent examiners indicates that most patent examiners generally approved of USPTO's retention efforts, and ranked the agency's salary and other pay incentives as well as the flexible work schedule among the primary reasons for staying with the agency.

Contents

Letter		1
	Results in Brief	4
	Background	6
	USPTO's Annual Hiring Estimates Are Determined by Funding and Institutional Capacity and Are Unlikely to Reduce the Patent Application Backlog	9
	Attrition Has Greatly Offset Hiring over the Last 5 Years, and Agency Management and Patent Examiners Disagree about the Reasons for Attrition	13
	Retention Incentives and Flexibilities Provided over the Last 5 Years Generally Align with the Primary Reasons Patent Examiners Identified for Staying at USPTO	19
	Conclusion	23
	Recommendation for Executive Action	23
	Agency Comments and Our Evaluation	23
Appendix I	Objectives, Scope, and Methodology	25
Appendix II	Selected Survey Results	31
Appendix III	Comments from the Department of Commerce	36
Appendix IV	GAO Contact and Staff Acknowledgments	38
Tables		
	Table 1: Retention Incentives and Flexibilities Provided by USPTO by Category, and Other Retention Efforts, Fiscal Years 2002 through 2006	20
	Table 2: Number of Bonuses and Bonus Amounts USPTO Awarded, and Number of Patent Examiners Participating in the Telework Program in Fiscal Years 2002 through 2006	21
	Table 3: Patent Examiners' Views on Compensation-Related and Enhanced Work Environment Incentives and Flexibilities in Decreasing Order of Importance	22

Table 4: Summary of Patent Examiner Population and Survey Sample by Stratum	27
--	----

Figures

Figure 1: USPTO Patent Examiner Projected Hiring Estimates and Actual Number Hired, Fiscal Years 2002 through 2006	11
Figure 2: Patent Examiner Attrition by Years of Experience, Fiscal Years 2002 through 2006	14
Figure 3: Estimated and Actual First Actions Completed, Fiscal Years 2002 through 2006	18

Abbreviations

GS	general schedule
OPM	Office of Personnel Management
PALM	Patent Application Locating and Monitoring
POPA	Patent Office Professional Association
UPR	utility, plant, and reissue
USPTO	U.S. Patent and Trademark Office

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States Government Accountability Office
Washington, DC 20548

September 4, 2007

The Honorable Tom Davis
Ranking Member
Committee on Oversight and Government Reform
House of Representatives

Dear Mr. Davis:

Protecting intellectual property rights and encouraging technological progress are important for ensuring the current and future competitiveness of the United States. The U.S. Patent and Trademark Office (USPTO) helps protect the nation's competitiveness by granting patents for innovations ranging from new treatments for diseases, to new wireless technology applications, to new varieties of plants.¹ USPTO's ability to keep up with the demand for patents is essential for achieving its mission. However, increases in both the volume and complexity of patent applications have lengthened the amount of time it takes the agency to process them. As a result, the inventory of patent applications that have not yet been reviewed, called the backlog, has been growing for over 15 years—since fiscal year 2002 alone, the backlog has increased by nearly 73 percent to about 730,000 applications.

Inventors submit applications to USPTO to obtain a patent for their inventions and the right it affords the holder to exclude others from making, using, or selling the patented item in the United States. USPTO is funded by fees collected from the public for specific activities related to processing applications. The spending of these fees is subject to provisions determined by Congress in annual appropriations acts. USPTO relies on a workforce of nearly 5,000 patent examiners—attorneys, engineers, and other scientific and technical professionals—to review and make decisions on patent applications. The number of these professionals that USPTO hires, as well as the overall size and experience of the patent examination workforce, affects the number of applications that can be reviewed in any given year. As part of the review process, patent examiners are assigned what is known as a biweekly “production goal” on the basis of their position in the agency and the types of patent

¹USPTO, an agency within the Department of Commerce, consists of two organizations: one for patents and one for trademarks. This report focuses on the patent organization.

applications they are assigned to review.² Production goals are the number of specific actions and decisions that patent examiners must make about patent applications they review during a 2-week period.³ Patent examiners' performance is assessed biweekly on their ability to meet their production goals; their inability to meet these goals could have an impact on their compensation and continued employment with the agency. However, as we noted in 2005, the assumptions underlying the agency's production goals were established over 30 years ago and have not since been updated.

Since 2000, USPTO has implemented a variety of human capital flexibilities intended to help recruit and retain enough patent examiners and maintain a workforce that is sufficient to meet the demand for patents. These flexibilities have included the use of recruitment bonuses, law school tuition reimbursement, and a casual dress policy. In 2005, in response to congressional concerns about USPTO's efforts to attract and retain a qualified workforce, we reported that it was too soon to determine the long-term success of USPTO's recruitment and retention efforts because, in part, they had been inconsistently sustained during the limited time they had been in effect, and that not all of the planned initiatives had been implemented.⁴ However, concerns have continued because of increasing patent examiner attrition, especially among patent examiners who have been at the agency for less than 5 years, which is causing the

²USPTO assigns patent applications to one of its eight technology centers for review: (1) Biotechnology and Organic Chemistry; (2) Chemical and Materials Engineering; (3) Computer Architecture, Software, and Information Security; (4) Communications; (5) Semiconductors, Electrical and Optical Systems and Components; (6) Transportation, Electronic Commerce, Construction, Agriculture, National Security and License and Review; (7) Mechanical Engineering, Manufacturing, and Products; and (8) Designs for Articles of Manufacture.

³USPTO tracks two key milestones in the patent application process to evaluate patent examiners' performance. One milestone is the patent examiner's initial action on the merits of the case. Most patent applications are removed from the backlog when this initial action is made. The other milestone is when the application is allowed, abandoned, or sent to the Board of Patent Appeals and Interferences.

⁴GAO, *Intellectual Property: USPTO Has Made Progress in Hiring Examiners, but Challenges to Retention Remain*, [GAO-05-720](#) (Washington, D.C.: June 17, 2005).

workforce to grow at a slower rate than would be expected given the number of patent examiners the agency has been hiring each year.⁵

In this context, you asked us to determine, for the last 5 years, (1) USPTO's process for identifying its annual hiring estimates and the relationship of these hiring estimates to the patent application backlog; (2) the extent to which patent examiner hiring has been offset by attrition at USPTO, and what factors may contribute to patent examiners' decisions to leave the agency; and (3) the extent to which the retention incentives and flexibilities USPTO has implemented align with patent examiners' reasons for staying with the agency.

To determine USPTO's process for developing annual hiring estimates and the relationship these estimates have to the patent application backlog, we interviewed agency officials and reviewed agency documents and reports by other organizations relating to USPTO's workforce planning process, including data the agency used to identify the number of patent examiners it planned to hire in each of the last 5 fiscal years. We analyzed patent examiner and patent application data for the last 5 fiscal years, as well as USPTO's projections of that data through fiscal year 2012. In addition, we reviewed the Office of Personnel Management's (OPM) workforce planning guidance and interviewed officials from OPM's Human Capital Assessment and Accountability Framework Office to develop criteria to assess USPTO's workforce planning process. To determine the extent to which patent examiner hiring has been offset by attrition at USPTO over the last 5 years, we analyzed patent examiner workforce, hiring, and attrition data from this time period. To determine factors that may contribute to patent examiners' decisions to leave the agency, we conducted a Web-based survey of a stratified random sample of 1,420 USPTO patent examiners. Overall, we received an 80 percent response rate to our survey. Estimates based on this survey allow us to project our results to all patent examiners at USPTO with a 95 percent level of confidence. All percentage estimates included in this report have a 95 percent confidence interval with plus or minus 5 percentage points. To

⁵USPTO includes patent examiners who transfer or are promoted out of the patent examination workforce to another position within the agency in its attrition count, in addition to those patent examiners who leave the agency. This report uses USPTO's inclusive definition of attrition in order to be consistent with the agency's projections used in this report, and therefore will be different from USPTO attrition data as reported by the Office of Personnel Management, which does not include intra-agency transfers or promotions as part of attrition.

address this objective, we had to rely on the views of current patent examiners because USPTO does not maintain contact information for patent examiners that have left the agency and we could not identify any organizations that maintain this information for USPTO staff. In addition, we interviewed USPTO officials, representatives of the patent examiner union—the Patent Office Professional Association (POPA)—and an official from the American Intellectual Property Law Association. To determine the extent to which the retention incentives and flexibilities provided by USPTO align with patent examiners’ reasons for staying with the agency, we interviewed USPTO officials about the retention incentives and flexibilities they have used in the past 5 years, reviewed our previous report on USPTO’s recruitment and retention efforts, interviewed representatives from POPA and an official from the American Intellectual Property Law Association to obtain their perspectives on factors affecting patent examiner retention and workload, and used the Web-based survey described above to obtain patent examiners’ views on USPTO’s retention incentives and flexibilities. Specifically, we sought patent examiners’ views on the reasons they would choose to stay at the agency. Appendix I contains a more detailed discussion of our scope and methodology. We conducted our work from August 2006 through July 2007 in accordance with generally accepted government auditing standards.

Results in Brief

In each of the last 5 years, USPTO has identified its annual hiring estimates on the basis of the agency’s funding levels and institutional capacity to support additional staff and not on the existing backlog or the expected patent application workload. Because of its increasing workload relative to its existing workforce, over the last 5 years, USPTO has had to hire additional patent examiners each year. The primary factors that determined USPTO’s annual hiring estimates during this time have been the agency’s annual funding levels and its capacity to train and supervise new patent examiners. About 18 months before the start of the hiring year, USPTO considers these factors to determine its projected hiring estimates for the coming year. During these 18 months, the agency refines these estimates on the basis of its most current budget and patent examination workforce data to determine the number of patent examiners the agency can actually hire. In each of the last 5 years, for various reasons, the number of patent examiners the agency actually hired differed from the hiring estimate that the agency had originally projected. For example, the projected hiring estimate for fiscal year 2004 was 750 patent examiners, but the agency actually hired 443 because of subsequent funding limitations. USPTO’s current process is consistent with workforce planning strategies endorsed by OPM, though it is a significant deviation

from the agency's previous workforce planning strategy, which was more directly linked to the patent examination workload. Over the last 5 years the agency has moved away from its prior strategy because it realized that it did not have the institutional capacity to train and supervise the relatively large number of new patent examiners it would need to hire annually to keep pace with the increasing number of incoming patent applications expected each year. Although shifting to its current approach has enabled USPTO to better match its hiring estimates to its institutional training and supervisory capacity, this approach does not take into account how many patent examiners are needed to reduce the backlog of existing patent applications or address the expected inflow of new applications. Consequently, the patent application backlog has continued to increase, and it is unlikely that the agency will be able to reduce the backlog simply through its hiring efforts.

From 2002 through 2006, patent examiner attrition has continued to significantly offset USPTO's hiring progress. Although USPTO is hiring as many new patent examiners as it has the annual capacity to supervise and train, for nearly every two patent examiners it has hired over the last 5 years at least one has left the agency. Specifically, USPTO hired 3,672 patent examiners between 2002 and 2006, and 1,643 patent examiners left the agency during this time. More importantly, of those who left, 70 percent had been at USPTO for less than 5 years. This is a significant loss to the agency because, according to USPTO officials, new patent examiners are primarily responsible for making the initial decisions on applications, which removes them from the backlog. We found that within the agency there is significant disagreement about why patent examiners are continuing to leave. According to USPTO management, patent examiners leave primarily for personal reasons—for example, because the job is not a good fit for them or they need to relocate because of a spouse's job. In contrast, patent examiners, and the union officials who represent them, identified unrealistic agency production goals, which were established 30 years ago, as one of the primary reasons patent examiners may choose to leave. For example, union officials told us that attrition can primarily be attributed to the insufficient amount of time provided to patent examiners to meet their production goals. This was supported by our survey of patent examiners, in which 67 percent indicated that the agency's production goals were among the primary reasons they would consider leaving USPTO. Moreover, to meet their production goals, the majority of patent examiners had to work substantial unpaid overtime in the last 12 months, while many others worked while on annual leave. According to one of our survey respondents, "vacation time means catch up time." Such a large percentage of patent examiners working extra time

to meet their production goals, is an indication that USPTO's production goals may no longer accurately reflect the time patent examiners need to review applications. Given the high rate of attrition that may result, in part, from such outdated production goals, we are recommending that USPTO undertake a comprehensive evaluation of how it establishes these goals and revise these goals as appropriate.

The retention incentives and flexibilities that USPTO has provided over the last 5 years generally align with the primary reasons patent examiners identified for staying at the agency. USPTO management told us that their most effective retention efforts have been those that provide additional compensation to and an enhanced work environment for patent examiners. Specifically, USPTO officials identified the agency's special pay rates, which can be more than 25 percent above federal salaries for comparable positions; the agency's bonus structure, which allows patent examiners to earn various cash awards for exceeding production goals; and opportunities for patent examiners to work either part-time or full-time from remote locations as being the most effective retention measures for the agency. For example, in fiscal year 2006, USPTO awarded 4,645 bonuses to patent examiners totaling over \$10.6 million; patent examiners may receive up to three different types of bonuses in a fiscal year. That same year, approximately 20 percent of patent examiners participated in the agency's telework program, which allows patent examiners to work some or all of their time from an off-site location, and approximately 10 percent of patent examiners were enrolled in the hoteling program, through which USPTO provides equipment to those patent examiners who are approved to work full-time from an off-site location. According to our survey, most patent examiners generally identified these types of retention incentives and flexibilities as among the most important reasons to stay at the agency. For example, 58 percent of patent examiners identified salary, and 49 percent flexible work schedules, as the primary reasons for staying with the agency.

In its written comments on a draft of our report (reprinted in app. II), the Department of Commerce agreed with our findings, conclusions, and recommendation. In addition, the agency provided technical comments that we have incorporated as appropriate.

Background

To obtain a patent, inventors—or more usually their attorneys or agents—submit an application to USPTO that fully discloses and clearly describes one or more distinct innovative features of the proposed invention and pay a filing fee to begin the examination process. Patent examiners review

these applications to determine if a patent is warranted. In making this determination, patent examiners must meet two specific milestones in the patent examination process: first actions and disposals.

- **First action.** Patent examiners notify applicants about the patentability of their invention through what is called a first action. After determining if the invention is new and useful, or a new and useful improvement on an existing process or machine, patentability is determined through a thorough investigation of information related to the subject matter of the patent application and already available before the date the application was submitted, called prior art. Prior art includes, but is not limited to, publications and U.S. and international patents.
- **Disposal.** Patent examiners dispose of a patent application by determining, among other things, if a patent will be granted—called allowance—or not.

Patent examiners receive credit, called counts, for each first action and disposal, and are assigned production goals (also known as quotas) on the basis of the number of production units—composed of two counts—they are expected to achieve in a 2-week period. The counts in a production unit may be any combination of first actions and disposals.

The production goals that are used to measure patent examiner performance are based on the same assumptions that USPTO established in the 1970s. At that time, the agency set production goals in the belief that it should take a patent examiner a certain amount of time to review a patent application and achieve two counts based on the patent examiner's experience (as determined by the patent examiner's position in the agency) and the type of patent application reviewed. As a result, these goals vary depending upon the patent examiner's position in the federal government's general schedule (GS) pay scale and the technology center in which the patent examiner works.⁶ For example, a GS-12 patent examiner working on data processing applications is expected to achieve two counts in 31.6 hours, whereas a GS-12 patent examiner working on plastic molding applications is expected to do so in 20.1 hours. In contrast, GS-7 patent examiners working on these two types of applications are expected to achieve two counts in 45.1 and 28.7 hours, respectively.

⁶Technology centers specialize in specific areas of science and engineering.

Patent examiner achievements are recorded biweekly, and, at the end of each fiscal year, those patent applications that have not been reviewed for first action are counted as part of USPTO's inventory of unexamined applications, otherwise known as the patent application backlog. In 2002, we reported that the patent application backlog had increased by nearly 250 percent from 1990 to 2001, and that USPTO had projected that the inventory would increase to between 393,000 and 512,000 in fiscal year 2002.⁷ In addition, we reported that the agency had made three significantly different predictions about the future of the backlog in three separate reports that were based on different assumptions:

- In its *Fiscal Year 2002 Corporate Plan*, in 2001, USPTO projected that the backlog would increase to almost 1.3 million by the end of fiscal year 2006.
- In USPTO's *Business Plan*, in 2002, the agency projected that the backlog would increase to about 584,000 through fiscal year 2007.
- In the *21st Century Strategic Plan*, in 2002, USPTO projected that the backlog would decrease to about 144,000 through fiscal year 2007.⁸

In 2005, we also reported on USPTO's efforts and challenges in attracting and retaining a qualified patent examination workforce. Specifically, we reported that USPTO faced human capital challenges because, among other things, it had not established an effective mechanism for managers to communicate and collaborate with patent examiners, and managers and patent examiners had differing opinions on the need to update the monetary award system that is based on assumptions of the time it takes to review a patent application that were established in 1976. We recommended that USPTO develop formal strategies to improve communication and collaboration among management, patent examiners, and the union to resolve key issues identified in the report, such as the assumptions underlying the quota system. In response to that recommendation, USPTO conducted an internal survey on communication, and is working to develop a communication strategy on

⁷GAO, *Intellectual Property: Information on the U.S. Patent and Trademark Office's Past and Future Operations*, GAO-02-907 (Washington, D.C.: Aug. 23, 2002).

⁸USPTO's *Corporate Plan* was submitted with the fiscal year 2002 budget. USPTO's *Business Plan* was the agency's first 5-year strategic plan. It was replaced by the *21st Century Strategic Plan* after a new Director decided the *Business Plan* did not go far enough.

the basis of the results. However, the agency has not addressed the issues we identified relating to the assumptions underlying the quota system.

USPTO's Annual Hiring Estimates Are Determined by Funding and Institutional Capacity and Are Unlikely to Reduce the Patent Application Backlog

Over the last 5 years, as a result of its increasing workload relative to its existing workforce, USPTO determined that it would need to hire additional patent examiners each year. However, the agency identified its annual hiring estimates primarily on the basis of available funding levels and its institutional capacity to train and supervise new patent examiners, and not on the basis of the number of patent examiners needed to reduce the existing backlog or review new patent applications. While the process USPTO uses to identify its annual hiring estimates is consistent with OPM's workforce planning strategies and has enabled the agency to better match its hiring estimates to its institutional capacity, it is unlikely that the agency will be able to reduce the patent application backlog simply through its hiring efforts.

USPTO's Funding Levels and Supervisory and Training Capacity Determine Its Annual Hiring Estimates

According to USPTO, during the last 5 years, the agency has used its available funding levels and its capacity to supervise and train patent examiners as the primary factors for identifying its projected annual hiring estimates. Specifically, USPTO begins the process of identifying projected hiring estimates as part of creating its budget submission for the Office of Management and Budget (OMB) 18 months before the start of the hiring year in order to meet OMB's budget submission timeline. As part of this process, the agency considers expected funding levels and patent examiner workforce data that are available at that time.⁹ On the basis of these data, USPTO next considers its institutional capacity to supervise and train patent examiners. For example, in identifying its fiscal year 2002 hiring estimate, USPTO determined that funding availability would limit the number of patent examiners the agency would be able to hire, and used the number of patent examiners it had hired in the most recent year as a guide for its projected hiring estimate. However, in fiscal years 2003 through 2006, USPTO determined that funding levels would not be a limiting factor for hiring, and therefore established its hiring estimates

⁹In commenting on a draft of this report, USPTO stated that it uses a robust forecasting and modeling process to determine the optimal hiring, staffing, and production levels. This model was evaluated by the National Academy of Public Administration and determined to be appropriate. While we acknowledge that USPTO uses this model to identify optimal hiring levels, we found that the determination of projected estimates was made on the basis of funding levels and the capacity to support additional staff.

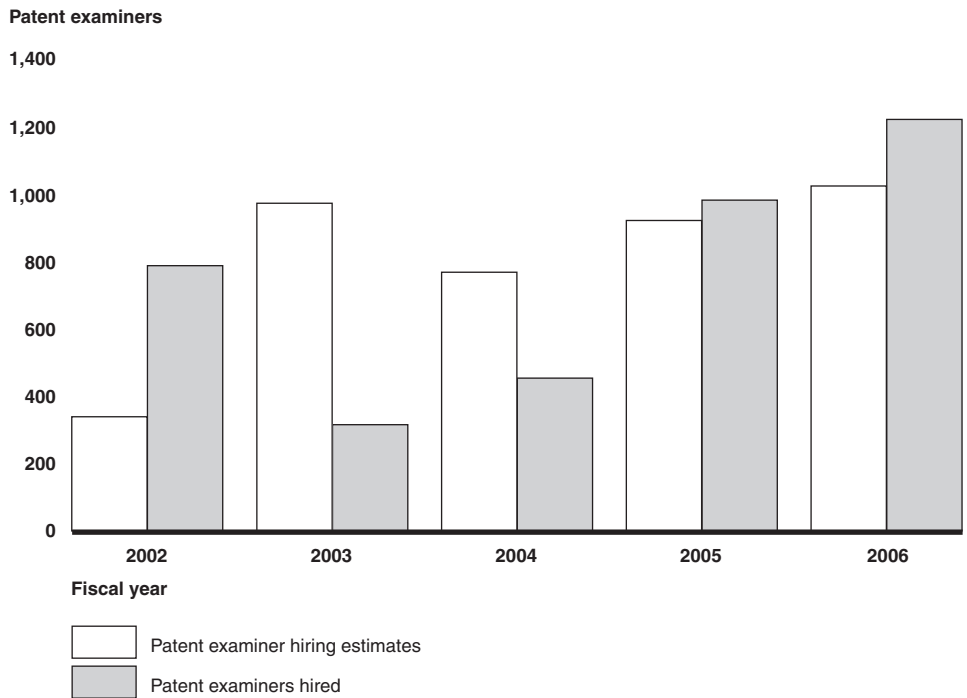
primarily based on its institutional capacity to supervise and train patent examiners.

In determining its institutional capacity to supervise and train new patent examiners, USPTO considers a number of factors. For example, the agency estimates its supervisory capacity by determining how many additional patent examiners can be placed in each of the technology centers. This number is limited by the number of supervisors available in each center who can sign patent application approvals and rejections and provide on-the-job training for new patent examiners. Although new patent examiners can review the prior art relating to a patent application, only supervisors can authorize a new patent examiner's decision to approve or reject a patent application.¹⁰ Therefore, the agency tries to ensure that the patent-examiner-to-supervisor ratio is about 1 supervisor for every 12 patent examiners; otherwise it could result in delays and inefficiencies in making initial and final decisions on patent applications. Similarly, USPTO's training capacity is determined by the number of patent examiners the agency believes it can train in a year. Before fiscal year 2006, training capacity was determined by how many patent examiners could be accommodated in the required training courses offered by the agency to new patent examiners. This training consisted of 2- or 3-week courses that were offered throughout the year and were led by supervisory patent examiners. The courses could accommodate about 16 patent examiners each, and in fiscal year 2004, according to USPTO, the agency offered about 28 training sessions.

Because USPTO's projected hiring estimates are established at least 18 months in advance of the hiring year, USPTO continues to refine them to reflect changes that might occur during the 18-month period. For example, in 2002 USPTO established a projected hiring estimate of 750 patent examiners for fiscal year 2004 when it created its budget submission for OMB. However, USPTO actually hired 443 patent examiners in fiscal year 2004 because of budget constraints that had to be considered after its original estimates had been developed. Figure 1 shows USPTO's projected and actual hiring numbers for fiscal years 2002 through 2006.

¹⁰We are including both supervisory patent examiners and primary examiners as supervisors for the purpose of this report.

Figure 1: USPTO Patent Examiner Projected Hiring Estimates and Actual Number Hired, Fiscal Years 2002 through 2006



Source: USPTO.

The reasons for the differences between projected hiring estimates and the number of patent examiners hired in fiscal years 2002 through 2006 were primarily related to funding availability. In fiscal years 2003 and 2004, according to USPTO, the agency's appropriations were significantly less than the agency's budget requests. As a result, the agency could not financially support the number of new patent examiners it had initially planned to hire. Conversely, in fiscal years 2005 and 2006, USPTO hired more patent examiners than originally planned because the agency received greater funding for those years than originally anticipated.

The way in which USPTO identifies annual patent examiner hiring estimates is generally consistent with workforce planning strategies endorsed by OPM. OPM has identified key elements that agencies should consider when planning to hire additional personnel, and OPM officials told us that these key elements are well recognized throughout the field of workforce planning. For example, OPM recommends that agencies regularly track workforce trends to ensure updated models for meeting

organizational needs, base decisions on sources of information such as past workforce data, and include in its workforce planning process a workforce analysis system that identifies current and future losses due to attrition. We found that in identifying its hiring estimates, USPTO generally applies these principles because it makes decisions on the basis of trends in hiring, attrition, and total workforce data from recent years, and identifies current losses due to attrition when identifying its annual hiring estimates and estimates of attrition for the hiring year.

Although consistent with OPM's workforce strategies, USPTO's current approach is significantly different from the approach that the agency used prior to fiscal year 2002. At that time, the number of patent examiners USPTO wanted to hire was based on the number of patent applications the agency expected to receive in the hiring year, as well as on the anticipated patent application backlog at the beginning of the hiring year. According to USPTO officials, since fiscal year 2002, the agency has moved away from this approach because it realized that it could no longer supervise and train enough patent examiners to keep up with the increasing workload.

However, USPTO recognizes that it needs to increase its institutional capacity to hire more patent examiners, and in this regard is taking steps to increase its training and supervisory capacity. For example, to increase its training capacity, USPTO implemented an 8-month training program in fiscal year 2006 called the Patent Training Academy that will provide the agency a constant annual training capacity of 1,200 new patent examiners for each of the next 5 years. USPTO also believes that the academy may indirectly improve the agency's supervisory capacity because it will better prepare new patent examiners to start work in a technology center, and therefore they will need less supervision and on-the-job training. USPTO plans to monitor new patent examiners after they have graduated from the academy in order to determine if the agency can further use this approach to increase its institutional capacity and, therefore, its future annual hiring estimates.

Even with its increased hiring estimates of 1,200 patent examiners each year for the next 5 years, USPTO's patent application backlog will continue to grow, and is expected to increase to over 1.3 million at the end of fiscal year 2011. According to USPTO estimates, even if the agency were able to hire 2,000 patent examiners per year in fiscal year 2007 and each of the next 5 years, the backlog would continue to increase by about 260,000 applications to 953,643 at the end of fiscal year 2011. The agency has acknowledged that it cannot hire its way out of the backlog despite its

recent increases in hiring, and is now focused on slowing the growth of the backlog instead of reducing it.

Attrition Has Greatly Offset Hiring over the Last 5 Years, and Agency Management and Patent Examiners Disagree about the Reasons for Attrition

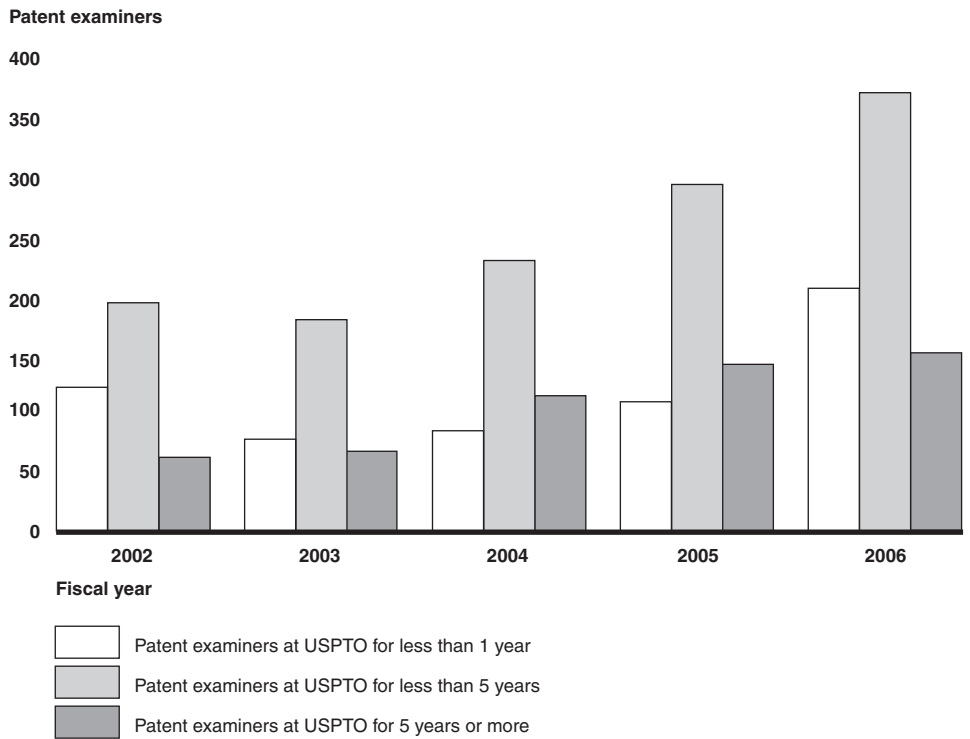
Although USPTO is hiring as many new patent examiners as it has the annual funding and institutional capacity to support, increasing attrition among patent examiners has resulted in the loss of one patent examiner for nearly every two hired over the last 5 years. While agency officials cited personal reasons for patent examiner attrition, patent examiners disagreed and cited the agency's outdated production goals as one of the primary reasons they would choose to leave the agency.

Over the Last 5 Years, One Patent Examiner Has Left USPTO for Nearly Every Two Hired

Although USPTO hired 3,672 patent examiners from the beginning of fiscal year 2002 through fiscal year 2006, the patent examination workforce increased by only 1,644 because 2,028 patent examiners either left the agency or moved to other positions. More specifically, during this time, 1,643 patent examiners left the agency, and 385 patent examiners were either transferred or promoted out of the position of patent examiner. As shown in figure 2, of the 1,643 patent examiners who left the agency, approximately 70 percent had been at USPTO for less than 5 years, and nearly 33 percent had been at USPTO for less than 1 year.¹¹

¹¹These percentages include patent examiners who transferred or were promoted out of the patent examination workforce, but remained at USPTO, and represent approximately 19 percent of patent examiner attrition from fiscal year 2002 through 2006.

Figure 2: Patent Examiner Attrition by Years of Experience, Fiscal Years 2002 through 2006



Source: USPTO.

Note: In each fiscal year, the number of patent examiners at USPTO for less than 5 years is inclusive of those at USPTO for less than 1 year.

The attrition of patent examiners who were at the agency for less than 5 years is a significant loss for USPTO for a variety of reasons. First, because these less experienced patent examiners are primarily responsible for making the initial decision on patent applications, which is the triggering event that removes applications from the backlog, attrition of these staff affects USPTO's ability to reduce the patent application backlog. Second, because patent examiners require 4 to 6 years of on-the-job experience before they become fully proficient in conducting patent application reviews, when these staff leave USPTO the agency loses as much as 5 years of training investment in them. Third, the continuous churning of so many new patent examiners makes the overall workforce less experienced. As a result, the more experienced patent examiners who have the ability to examine more applications in less time have to instead devote more of their time to supervising and training the less experienced

staff, thereby further reducing the overall productivity of the agency. Finally, these workforce losses affect the agency's supervisory capacity, because they reduce the pool of potential supervisory patent examiners for the future and therefore negatively affect USPTO's ability to increase its capacity and ultimately its hiring goals.

USPTO Management Links Attrition to Employees' Personal Reasons, while Patent Examiners Link It to the Agency's Production Goals

We found that USPTO management and patent examiners disagree significantly on the reasons for the attrition that is occurring at the agency. According to USPTO management, personal reasons are the primary reasons that cause patent examiners to leave the agency.¹² Some of these reasons include the following:

- The nature of the work at USPTO does not fit with the preferred working styles of some patent examiners such as those with engineering degrees who are looking for more "hands-on" experiences.
- Many patent examiners enter the workforce directly out of college and are looking to add USPTO to their résumés and move on to another job elsewhere rather than build a career at the agency, otherwise known as the "millennial problem."
- Patent examiners may choose to leave the area, as opposed to choosing to leave the agency, because their spouse transfers to a position outside of the Washington, D.C., area; the cost of living is too high; or the competition is too high for entry into the Washington, D.C., area graduate and postgraduate programs for those patent examiners who would like to pursue higher education.

USPTO management told us that the agency is taking steps to help address these issues through efforts such as developing a recruitment tool to better assess applicant compatibility with the agency's work environment; targeting midcareer professionals during the recruitment process; and considering the creation of offices located outside the Washington, D.C., area that would provide lower cost-of-living alternatives for employees.

While union officials agreed that in some cases personal reasons, such as the high cost of living in the Washington, D.C., area, may lead to attrition

¹²The term "primary reasons" in this report refers to the top three reasons patent examiners leave the agency provided by USPTO management, as well as the top three or more statistically significant reasons provided by patent examiners in our survey.

among patent examiners, they believe that attrition at USPTO can be primarily attributed to the unrealistic production goals that the agency sets for patent examiners.¹³ Specifically, union officials explained that the production goals do not allow adequate time for patent examiners to do their work, especially in light of the increased scrutiny and quality initiatives implemented by management. They told us that the production goals have created a “sweat shop culture” within the agency that requires patent examiners to do more in less time and has therefore been a significant contributor to patent examiners’ decisions to leave USPTO. To emphasize this concern, the union joined the Staff Union of the European Patent Office and other international patent examiner organizations in April 2007 to sign a letter declaring that the pressures on patent examiners around the world have reached such a level that in the absence of serious measures, intellectual property worldwide would be at risk. The letter recommended, among other things, an increase in the time patent examiners have to review patent applications.

According to our survey of patent examiners, 67 percent, regardless of their tenure with the agency, agree with union officials that the agency’s production goals are among the primary reasons they would consider leaving USPTO. Moreover, we estimated that 62 percent of patent examiners are very dissatisfied or generally dissatisfied with the time allotted by USPTO to achieve their production goals. According to our survey, 50 percent of patent examiners are also very dissatisfied or generally dissatisfied with the way in which the agency’s production goals are calculated, and a number of respondents noted that the production goals are outdated, have not changed in 30 years, and some technologies for which they evaluate applications had not even been discovered at the time the agency’s production goals were set. When asked for suggestions on how to improve the production system, 59 percent of patent examiners felt that the system needs to be reevaluated, including altering the production goals to allow more time for patent examiners to conduct their reviews.

¹³Union officials also identified a recent decision by USPTO management to track when patent examiners enter and leave the building as another reason why patent examiners would choose to leave the agency. Union officials declined to rank the reasons they believe patent examiners leave USPTO, preferring instead that we rely on patent examiner survey results.

USPTO employees who participated in OPM's 2006 Federal Human Capital Survey reported similar results.¹⁴ Specifically, 89 percent of the respondents, comprising both patent examiners and managerial/supervisory employees, reported that they believe the work they do is important.¹⁵ However, respondents were almost evenly split on whether their workload was reasonable, with 41 percent considering their workload reasonable and 40 percent considering it unreasonable.

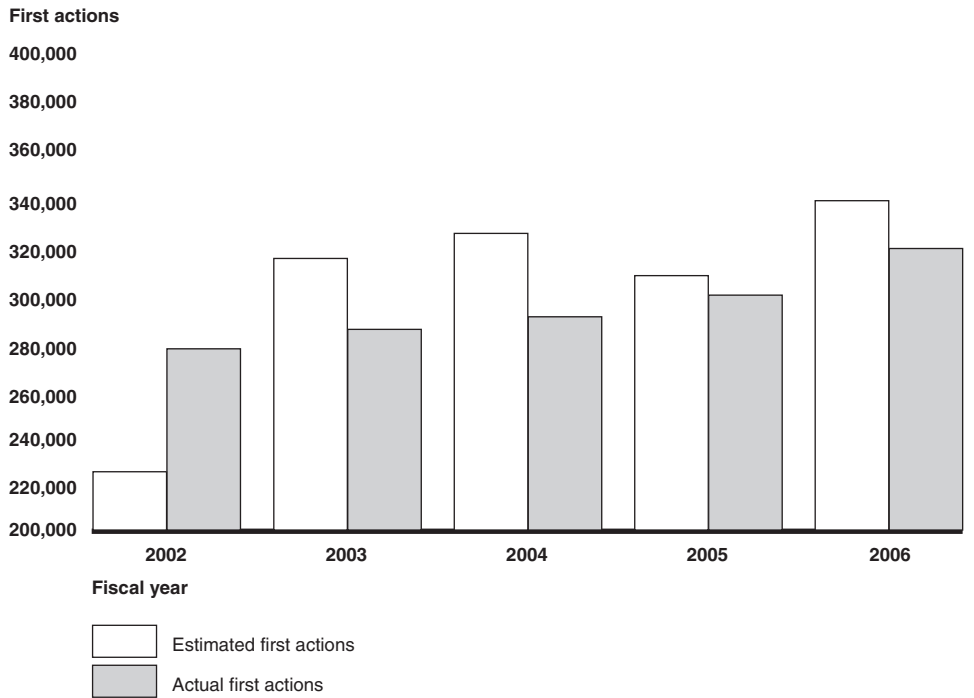
We and others have noted in the past that the assumptions the agency uses to calculate patent examiner production goals were established in the 1970s and have not since been adjusted to reflect changes in science and technology. Moreover, the agency uses these production goals to establish its overall performance goals, such as the number of first actions to be completed in a given year.¹⁶ However, the agency has missed its projections for first actions completed in 4 of the last 5 years, as shown in figure 3, which further suggests that these goals may be unrealistic.

¹⁴OPM's Federal Human Capital Survey is a tool that measures employees' perceptions of whether, and to what extent, conditions that characterize successful organizations are present in their agencies.

¹⁵USPTO respondents to the Federal Human Capital Survey included employees from both the patent organization, which accounts for about 76 percent of the agency's resources, and the trademark organization.

¹⁶USPTO predicts first actions by multiplying the number of patent examiners in the workforce by production goals.

Figure 3: Estimated and Actual First Actions Completed, Fiscal Years 2002 through 2006



Source: USPTO.

Furthermore, according to our survey, patent examiners are discontented with the actions they have to take in order to meet their production goals. According to our survey, during the last year, 70 percent of patent examiners worked unpaid overtime to meet their production goals, some more than 30 extra hours in a 2-week period. The percentage of patent examiners who worked unpaid overtime increased with the length of tenure they had with the agency. We estimated that while 46 percent of patent examiners who had been at USPTO from 2 to 12 months had to work unpaid overtime to meet their production goals; 79 percent of patent examiners with over 5 years' experience at the agency had to put in unpaid overtime. In addition, we estimated that 42 percent of patent examiners had to work to meet production goals while on paid annual leave during the past year. The percentage of patent examiners working while on paid leave also was significantly higher for those with a longer tenure at the agency. We estimated that 18 percent of patent examiners who had been at USPTO from 2 to 12 months worked to meet their production goals while on paid leave, and 50 percent of patent examiners with over 5 years' experience at the agency had to work to meet production goals while on annual leave. As one respondent to our survey explained, "Vacation time

means catch up time.” Another respondent summed up the situation as follows: “I know that the production goals are set to keep us motivated in order to help get over the backlog but if a majority of examiners cannot meet those goals without relying on unpaid overtime or annual leave then something is wrong with the system.” We estimated that because of the amount of unpaid overtime that they have to put into meeting their production goals, 59 percent of patent examiners consider it one of the primary reasons they would choose to leave USPTO, and 37 percent identified the amount of time they must work during paid leave to meet their production goals among the primary reasons they would leave the agency.

This extensive amount of unpaid overtime does not appear to be a concern to USPTO management, even though the agency has not been able to meet its productivity goals for the last 4 years. When we queried USPTO management about the agency’s policy regarding patent examiners working unpaid overtime to meet their production goals, the Deputy Commissioner for Patent Operations told us, “As with many professionals who occasionally remain at work longer to make up for time during the day spent chatting or because they were less productive than intended, examiners may stay at the office (or remote location) longer than their scheduled tour of duty to work.”

Retention Incentives and Flexibilities Provided over the Last 5 Years Generally Align with the Primary Reasons Patent Examiners Identified for Staying at USPTO

From 2002 to 2006, USPTO offered a number of different retention incentives and flexibilities in three main areas to improve the retention of patent examiners, as shown in table 1.¹⁷

¹⁷GAO reported on key practices for effective use of human capital flexibilities in GAO, *Human Capital: Effective Use of Flexibilities Can Assist Agencies in Managing Their Workforces*, [GAO-03-2](#) (Washington, D.C.: Dec. 6, 2002).

Table 1: Retention Incentives and Flexibilities Provided by USPTO by Category, and Other Retention Efforts, Fiscal Years 2002 through 2006

Category	Retention incentive, flexibility, or other
Compensation	<ul style="list-style-type: none"> • Performance bonuses • Flexible spending accounts that allow patent examiners to set aside funds for expenses related to health care and care for dependents • Law school tuition reimbursement program^a • Noncompetitive promotion to the full performance level • Recruitment bonuses of up to \$9,900 • Special pay rate^b • Transit subsidy program
Enhanced work environment	<ul style="list-style-type: none"> • Casual dress policy • Flexible work schedules, including the ability to schedule hours off during the day • Improved management communication techniques (e.g., town hall meetings, online chats with the Commissioner) • No-cost health screenings at an on-site health unit staffed with a registered nurse and part-time physician • On-site child care and fitness centers • Creation of a committee to organize recreational and social activities, such as a basketball tournament and Halloween party • Work at home opportunities
Other retention efforts	<ul style="list-style-type: none"> • Additional training for managers, such as workshops on intergenerational issues and technical training for patent examiners • Formation of a Patents Retention Council to focus on patent examiner retention issues at USPTO • A survey given to potential applicants during the recruiting process to better assess applicant compatibility with the USPTO work environment

Source: GAO analysis of USPTO information.

^aUSPTO provided the law school tuition program for 2 years between fiscal years 2002 and 2006.

^bThe special pay rate was approved in 2006 and went into effect in January 2007.

According to USPTO management officials, the three most effective retention incentives and flexibilities that they have offered are the special pay rates, the bonus structure, and opportunities to work from remote locations.

- Special pay rate. In November 2006, USPTO received approval for an across-the-board special pay rate for patent examiners that can be more than 25 percent above federal salaries for comparable positions. For example, in 2007, a patent examiner at USPTO earning \$47,610

would earn \$37,640 in a similar position at another federal agency in the Washington, D.C., area.

- **Bonus structure.** The agency awards bonuses at the end of each fiscal year to patent examiners who exceed their production goals by at least 10 percent. For example, according to USPTO, 60 percent of eligible patent examiners who exceeded production goals by 10 percent or more received a bonus in fiscal year 2006. As table 2 shows, USPTO awarded 4,645 bonuses totaling over \$10.6 million to patent examiners in fiscal year 2006.¹⁸
- **Opportunities to work from remote locations.** In fiscal year 2006, approximately 20 percent of patent examiners participated in the agency’s telework program, which allows patent examiners to conduct some or all of their work away from their official duty station 1 or more days per week. In addition, when USPTO began a hoteling program in fiscal year 2006, approximately 10 percent of patent examiners participated in the program, which allows some patent examiners to work from an alternative location.¹⁹

Table 2: Number of Bonuses and Bonus Amounts USPTO Awarded, and Number of Patent Examiners Participating in the Telework Program in Fiscal Years 2002 through 2006

	2002	2003	2004	2005	2006
Number of bonuses ^a	4,877	4,839	5,015	4,567	4,645
Bonus amount (dollars in millions)	\$10.3	\$10.9	\$11.5	\$10.9	\$10.6
Patent examiners in telework program	Not applicable ^b	800	345	1014	999

Source: USPTO.

^aUp to three types of bonuses may be awarded to one patent examiner in a fiscal year, one of which may be awarded twice per fiscal year.

^bUSPTO did not offer a telework program in fiscal year 2002.

¹⁸USPTO may award up to three types of bonuses to one patent examiner in a fiscal year.

¹⁹Patent examiners who qualify for hoteling are assigned USPTO computer hardware and are not assigned permanent office space but share space when it is necessary for them to come into the USPTO offices.

According to the results of our survey, patent examiners generally identified compensation-related retention incentives and USPTO's efforts to enhance the work environment as among the most important reasons for staying with the agency. (See app. II for more detailed information on the questions included in and the results of our survey.) Specifically, as table 3 shows, patent examiners ranked current total pay, flexible work schedules, the hoteling program, and federal benefits as among the primary reasons they would choose to stay at USPTO. Similarly, 51 and 87 percent of the USPTO employees who participated in OPM's 2006 Federal Human Capital Survey reported that they were satisfied with their pay and alternative work schedules, respectively.

Table 3: Patent Examiners' Views on Compensation-Related and Enhanced Work Environment Incentives and Flexibilities in Decreasing Order of Importance

USPTO incentives and flexibilities offered to patent examiners	Estimated percentage of patent examiners who identified these incentives and flexibilities as reasons to stay with the agency
Current total pay (excluding benefits)	58
The availability of the flexible work schedule program	49
The availability of a hoteling program	38
Current federal benefits	30
The availability of a teleworking program	17
The recent implementation of a special pay rate increase	16
Opportunities for career advancement	15
The ability to be promoted to the next GS level	14
The availability of the law school tuition program	10
The availability of monetary awards	5
The casual dress policy	4
Access to an on-site fitness center	4
The availability of a transit subsidy program	2
The availability of on-site child care	1
The availability of flexible spending accounts (i.e., the program that allows you to pay for eligible out-of-pocket health care and dependent care expenses with pretax dollars)	1
The availability of an on-site health unit	0
Activities offered by the Work-Life Committee	0

Source: GAO survey.

Note: To determine the estimated percentages in this table, we included the total number of times patent examiners identified a particular retention incentive and flexibility as one of the three most important reasons they would choose to stay at USPTO.

Conclusion

Despite its efforts to hire an increasing number of patent examiners annually and implement a number of retention incentives and flexibilities over the last 5 years, USPTO has had limited success in retaining new patent examiners. While many of the measures implemented generally align with the primary reasons that patent examiners would stay with the agency, these efforts have not been enough to prevent the agency from losing one patent examiner for nearly every two that it has hired, and especially troubling is the high loss of patent examiners who have been with the agency for less than 5 years. Although USPTO management does not agree, the root of this high level of attrition appears to be the stress resulting from the agency's outdated production goals. To meet the agency's production goals, most patent examiners, regardless of their tenure with the agency, have had to work unpaid overtime or work during paid leave time, and therefore consider this to be a primary reason for leaving USPTO. Because the production goals appear to be undermining USPTO's efforts to hire and retain a highly qualified workforce, we believe the agency will continue to be limited in its ability to meet the increasing demand for U.S. patents and reduce the growth of the patent application backlog, and ultimately may be unable to fulfill its mission of ensuring U.S. competitiveness.

Recommendation for Executive Action

We recommend that the Secretary of Commerce direct the Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office to undertake a comprehensive evaluation of the assumptions that the agency uses to establish patent examiner production goals and revise those assumptions as appropriate.

Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Commerce and USPTO for review and comment. In its comments, the Department of Commerce agreed with our findings, conclusions, and recommendation and agreed that the agency's hiring efforts are not sufficient to reduce the patent application backlog. In light of this issue, the Department of Commerce stated that USPTO is implementing various initiatives designed to increase the productivity of the agency that will result in a more efficient and focused patent examination process. Once USPTO determines the effect of these initiatives on patent examiner productivity, it will reevaluate the assumptions used to establish patent examiner production goals. The agency also provided technical comments that we have incorporated as appropriate. The Department of Commerce's letter is included in appendix II.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to interested congressional committees and Members of Congress and the Secretary of Commerce. We also will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have questions about this report, please contact me at (202) 512-3841 or mittala@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

Sincerely yours,

A handwritten signature in black ink that reads "Anu K. Mittal". The signature is written in a cursive, flowing style.

Ms. Anu K. Mittal
Director, Natural Resources
and Environment

Appendix I: Objectives, Scope, and Methodology

To determine the U.S. Patent and Trademark's (USPTO) process for developing annual hiring estimates and the relationship these estimates have to the patent application backlog, we analyzed patent examiner data that USPTO extracts from the National Finance Center, and patent application data from the agency's Patent Application Locating and Monitoring (PALM) system,¹ from fiscal years 2002 through 2006, and projections of that data through fiscal year 2012.² Specifically, these data included actual end of fiscal year numbers from 2002 through 2006 and estimates from fiscal years 2002 through 2012 for patent examination workforce, patent examiners hired, patent examiners lost to attrition, first actions, received patent applications, and the patent application backlog. USPTO provided the majority of these data to us in the form of USPTO's fiscal years 2002 through 2008 Budget Requests of the President of the United States. The budget requests for fiscal years 2003 through 2005 contained the hiring estimates for each of those years as well as those projected for an additional 4 years, and the actual number of patent examiners hired for fiscal years 2002 and 2003.³ USPTO provided the remaining estimates in an interview, and the remaining actual numbers hired by extracting that information from the National Finance Center into Excel documents.

We assessed the reliability of the patent examiner data USPTO extracted from the National Finance Center and the agency's PALM system and determined that they were acceptable for our purposes. We assessed the reliability of patent examiner data by comparing the data to patent examiner data in the Central Personnel Data File. To assess the reliability of the PALM system, we interviewed the Acting Director of the Office of Patent Audit and Evaluation. We also interviewed USPTO's Administrator of the Office of Patent Resources Administration to gain an understanding of the process through which USPTO identifies hiring estimates and the role of the backlog in that process. In addition, we reviewed reports by other organizations, such as the National Academy of Public Administration, relating to USPTO's workforce planning process. We

¹ PALM is an internal USPTO system that contains current patent application status information.

² USPTO officials explained that the agency does not store patent examiner data on site, but relies on access to the National Finance Center to obtain that information when necessary.

³ According to USPTO, the data requirements for the budget requests can change and USPTO provides the required data to the Office of Management and Budget accordingly. As a result, not all of the information we requested was available in these documents.

reviewed the Office of Personnel Management's (OPM) workforce planning guidance and interviewed officials from OPM's Human Capital Assessment and Accountability Framework Office to develop criteria to assess USPTO's workforce planning process. We compared USPTO's process for developing annual hiring estimates to OPM's workforce planning strategies and other best practice information we received from OPM's Human Capital Assessment and Accountability Framework Office in order to determine if USPTO's process for identifying annual hiring estimates was consistent with OPM's recommended workforce planning strategies.

To determine the extent to which hiring patent examiners has been offset by attrition at USPTO over the last 5 years, we analyzed patent examiner workforce, hiring, and attrition data from this time period as described above. In addition, USPTO provided attrition data by years of experience for each of those years in separate documents derived from the National Finance Center. Specifically, we compared the total number of patent examiners hired in each of the last 5 years to the total workforce growth and the total patent examiner attrition in that time. To determine the factors that may contribute to patent examiners' decisions to leave the agency, we conducted a Web-based survey of a stratified random sample of 1,420 current patent examiners.⁴ To address this objective, we had to rely on the views of current patent examiners because USPTO does not maintain contact information for patent examiners that have left the agency, and we could not identify any organizations that maintain this information for USPTO staff. Through the survey instrument, we gathered patent examiners' views on satisfaction with various aspects of working at USPTO, the time worked to meet production goals, and reasons they would choose to stay with or leave the agency. In addition, we asked for their views on ways to improve the production system.

The target population for our sample consists of patent examiners who were employed by USPTO as of November 22, 2006, and were still employed as of the survey closing date, February 28, 2007. We selected

⁴While we also surveyed supervisory patent examiners, we did not include their responses in our analysis and estimates because we determined during the course of our review that they perform a very different function than nonsupervisory patent examiners. Consequently supervisory patent examiners have different job-related concerns and different reasons than nonsupervisory patent examiners for choosing to stay with or leave USPTO. Because our report focuses on why staff performing the patent examiner function stay with or leave the agency, we focused only on the responses of nonsupervisory patent examiners.

our sample from a study population composed of all USPTO patent examiners as of November 22, 2006, and we asked agency officials to provide the names, e-mail addresses, and length of time at USPTO for patent examiners at the agency on that date. Patent examiners who were hired after November 22, 2006, are not represented in our sample. Similarly, patent examiners who left or retired from the agency between November 22, 2006, and February 28, 2007, might be sampled but would not be a part of our target population (and therefore are considered out of the scope of our survey). From that list, we selected a random sample of patent examiners,⁵ stratified by the length of time they would have been at the agency at the beginning of the survey period in late January 2007.⁶ Our sample consisted of 1,420 patent examiners, and we obtained complete survey responses from 1,129 of them, for an overall response rate of about 80 percent. Table 4 summarizes population size, sample size, and disposition of sample cases for each of these strata.

Table 4: Summary of Patent Examiner Population and Survey Sample by Stratum

Stratum ^a	Population	Sample	Respondents	Out of scope ^a	Response rate
1. Patent examiners: 2-12 months	1,007	430	342	0	80%
2. Patent examiners: 1-5 years	1,506	480	385	0	80%
3. Patent examiners: 5+ years	2,305	510	402	8	80%
Total	4,818	1,420	1,129	8	80%

Source: GAO.

^aFrom the initial notification, we identified 8 sampled individuals who were outside the target population. Individuals were determined to be outside the target population for reasons such as they performed a function other than patent examination or they had since left the agency.

All sample surveys are subject to sampling error—that is, the extent to which the survey results differ from what would have been obtained if the whole population had been observed. Each patent examiner in the study population has a known nonzero probability of being selected, and the

⁵We defined patent examiners as those responsible for reviewing utility, plant, and reissue (UPR) patent applications.

⁶For example, a person newly hired at the time the population frame was created in late November 2006 would have been at the agency 2 months by late January 2007. This is why the shortest tenure displayed in table 4 is 2 months.

data for each respondent are appropriately weighted to account statistically for all patent examiners in that stratum, including those that were not selected. Because we followed a probability procedure based on random selections, our sample is only one of a large number of samples that we might have drawn. Since each sample could have provided different estimates, we expressed our confidence in the precision of our particular sample's results as a 95 percent confidence interval. This is the interval that would contain the actual population value for 95 percent of the samples we could have drawn. As a result, we are 95 percent confident that each of the confidence intervals based on the survey includes the true values in the sample population. Estimates based on this survey allow us to project our results to all patent examiners at USPTO with a 95 percent level of confidence. All percentage estimates in this report have a 95 percent confidence interval within plus or minus 5 percentage points of the estimate itself. For example, our survey estimates that 42 percent of patent examiners worked while on annual leave during the past year, and we are 95 percent confident that the actual proportion of patent examiners working while on leave during this period is within 5 percentage points of 42, i.e., between 37 and 47 percent. All reported comparisons of patent examiner groups for a particular survey question are statistically significant with a probability of 0.05.

In addition to the reported sampling errors, as previously indicated, the practical difficulties of conducting any survey may introduce errors, commonly referred to as nonsampling errors. For example, differences in how a particular question is interpreted, the information sources available to respondents, or the types of sample members who do not respond can introduce unwanted variability into the survey results. Our estimation method assumes that nonrespondents are missing at random. If characteristics of respondents are different from those of nonrespondents on key items, it could introduce a bias not accounted for in our analysis. We took extensive steps in questionnaire development, data collection, and the editing and analysis of the survey data to minimize nonsampling errors. For example, the survey was developed by a GAO survey specialist in conjunction with subject matter experts, and then reviewed by a second independent survey specialist. In addition, we pretested the survey with patent examiners. During these pretests, we asked the patent examiners to complete the survey as they would when they received it. We then interviewed the respondents to ensure that (1) the questions were clear and unambiguous, (2) the terms used were precise, (3) the survey did not place an undue burden on the patent examiners completing it, and (4) the survey was independent and unbiased. We also provided a copy of the survey to USPTO officials and representatives from the patent examiner

union—the Patent Office Professional Association (POPA)—to gain their thoughts on the four previously mentioned criteria. On the basis of the feedback from the pretests and our discussions with agency officials and union representatives, we revised the questions, as appropriate.

Additionally, the statistical programs that produced our survey estimates, including estimates of categories derived from content analysis, were reviewed by a second independent programmer to ensure accuracy in the logic and syntax of the program. Finally, to ensure security and data integrity, we provided all participants with a user name and a personal password that allowed them to access and complete the survey. No one else could access that survey or edit its data. To reduce survey nonresponse, we sent out e-mail reminder messages to encourage them to complete the survey. We activated the survey and informed respondents of its availability on January 25, 2007, and allowed respondents access to the survey through February 28, 2007.

We conducted a computer-enabled content analysis to analyze a key open-ended survey question soliciting respondents' suggestions for improvements to the production system. Two reviewers collaboratively developed content categories based on survey responses, and then independently assessed and coded each survey response into those categories. In cases where disagreements among the two reviewers regarding the coding of responses into content categories were found, all disagreements were resolved through reviewer discussion. Ultimately, there was 100 percent agreement between the reviewers.

In addition to the survey mentioned above, we spoke with USPTO officials, representatives from POPA, and an official from the American Intellectual Property Law Association, a national bar association of lawyers involved in fields of law affecting intellectual property, to gain their perspectives on why patent examiners leave the agency.

To determine the extent to which the retention incentives and flexibilities that USPTO provides align with patent examiners' reasons for staying with the agency, we spoke with USPTO officials, union representatives, and an official from the American Intellectual Property Law Association to gain their perspectives on the effectiveness of the retention incentives and flexibilities at USPTO. We also analyzed USPTO policies and information regarding the agency's retention incentives and flexibilities. In addition, we used the Web-based survey described above to obtain patent examiners' views on the reasons they would choose to stay at the agency.

**Appendix I: Objectives, Scope, and
Methodology**

We conducted our work from August 2006 through July 2007 in accordance with generally accepted government auditing standards.

Appendix II: Selected Survey Results

The following tables contain summary results of selected questions from our survey of patent examiners at USPTO. For each question reported below, the estimated percentage is presented. All percentage estimates have a 95 percent confidence interval within plus or minus 5 percentage points of the estimate itself. These tables do not include summary-estimate data for the demographic questions and do not include the results from any open-ended questions.

Q6. Over the past 12 months, on average, about how much voluntary/uncompensated overtime have you worked per biweek to meet your production goal?

Number of hours	Estimated percentage
Less than 1 hour	5
1-10 hours	62
11-20 hours	23
21-30 hours	5
More than 30 hours	5

Source: GAO survey.

Note: Respondents to this question had self-identified in a previous question as having worked voluntary/uncompensated overtime to meet their production goals.

Q8. Over the past 12 months, on average, about how much annual leave have you used per quarter to meet your production goal?

Number of hours	Estimated percentage
Less than 1 hour	2
1-10 hours	47
11-20 hours	29
21-30 hours	12
More than 30 hours	10

Source: GAO survey.

Note: Respondents to this question had self-identified in a previous question as having used annual leave to meet their production goals.

**Appendix II: Selected Survey
Results**

Q10a. How important, if at all, are each of the following factors as reasons for you to stay with USPTO?

Very important or important reason to stay

Reason	Estimated percentage
a. Your current total pay (excluding benefits)	77
b. Your current federal benefits	77
c. The availability of monetary awards	45
d. The recent implementation of a special pay rate increase	80
e. The caliber of your current supervision	58
f. The extent to which resources, such as mentors, are available to answer your questions	44
g. Your opportunities for career advancement	59
h. Your ability to be promoted to the next GS level	67
i. The extent to which this job fits your work style	71
j. Your production goals	17
k. The amount of paid leave that you must use to meet production goals	10
l. The amount of voluntary/uncompensated overtime that you must work to meet production goals	9
m. The amount of review of your work (i.e., for quality purposes)	14
n. Activities offered by the Work-Life Committee (e.g., 4 on 4 basketball tournament, trip to Atlantic City, but NOT activities run by the PTO Society or your Technology and/or Art Center)	11
o. The availability of the law school tuition program	43
p. The availability of a hoteling program (i.e., the opportunity for examiners to work full-time from an off-site location)	79
q. The availability of a teleworking program (i.e., the opportunity for examiners to work some hours from an off-site location)	77
r. The availability of the flexible work schedule program	94
s. The availability of flexible spending accounts (i.e., the program that allows you to pay for eligible out-of-pocket health care and dependent care expenses with pretax dollars)	42
t. The availability of a transit subsidy program	58
u. The availability of an on-site health unit	37
v. The casual dress policy	55
w. The availability of on-site child care	26
x. Access to an on-site fitness center	47
y. Other—Please specify below	34

Source: GAO survey.

**Appendix II: Selected Survey
Results**

Q10b. How important, if at all, are each of the following factors as reasons for you to leave USPTO?

Very important or important reason to leave

Reason	Estimated percentage
a. Your current total pay (excluding benefits)	8
b. Your current federal benefits	3
c. The availability of monetary awards	8
d. The recent implementation of a special pay rate increase	0
e. The caliber of your current supervision	11
f. The extent to which resources, such as mentors, are available to answer your questions	12
g. Your opportunities for career advancement	14
h. Your ability to be promoted to the next GS level	9
i. The extent to which this job fits your work style	10
j. Your production goals	52
k. The amount of paid leave that you must use to meet production goals	49
l. The amount of voluntary/uncompensated overtime that you must work to meet production goals	61
m. The amount of review of your work (i.e., for quality purposes)	27
n. Activities offered by the Work-Life Committee (e.g., 4 on 4 basketball tournament, trip to Atlantic City, but NOT activities run by the PTO Society or your Technology and/or Art Center)	2
o. The availability of the law school tuition program	1
p. The availability of a hoteling program (i.e., the opportunity for examiners to work full-time from an off-site location)	0
q. The availability of a teleworking program (i.e., the opportunity for examiners to work some hours from an off-site location)	0
r. The availability of the flexible work schedule program	0
s. The availability of flexible spending accounts (i.e., the program that allows you to pay for eligible out-of-pocket health care and dependent care expenses with pretax dollars)	0
t. The availability of a transit subsidy program	1
u. The availability of an on-site health unit	0
v. The casual dress policy	1
w. The availability of on-site child care	1
x. Access to an on-site fitness center	0
y. Other—Please specify below	39

Source: GAO survey.

**Appendix II: Selected Survey
Results**

Q11. Looking at the list of reasons in question 10, what are the top three reasons why you would choose to stay with USPTO?

Reason	Estimated percentage
a. Your current total pay (excluding benefits)	58
b. Your current federal benefits	30
c. The availability of monetary awards	5
d. The recent implementation of a special pay rate increase	16
e. The caliber of your current supervision	9
f. The extent to which resources, such as mentors, are available to answer your questions	3
g. Your opportunities for career advancement	15
h. Your ability to be promoted to the next GS level	14
i. The extent to which this job fits your work style	15
j. Your production goals	1
k. The amount of paid leave that you must use to meet production goals	0
l. The amount of voluntary/uncompensated overtime that you must work to meet production goals	0
m. The amount of review of your work (i.e., for quality purposes)	0
n. Activities offered by the Work-Life Committee (e.g., 4 on 4 basketball tournament, trip to Atlantic City, but NOT activities run by the PTO Society or your Technology and/or Art Center)	0
o. The availability of the law school tuition program	10
p. The availability of a hoteling program (i.e., the opportunity for examiners to work full-time from an off-site location)	38
q. The availability of a teleworking program (i.e., the opportunity for examiners to work some hours from an off-site location)	17
r. The availability of the flexible work schedule program	49
s. The availability of flexible spending accounts (i.e., the program that allows you to pay for eligible out-of-pocket health care and dependent care expenses with pretax dollars)	1
t. The availability of a transit subsidy program	2
u. The availability of an on-site health unit	0
v. The casual dress policy	4
w. The availability of on-site child care	1
x. Access to an on-site fitness center	4
y. Other—Please specify below	4

Source: GAO survey.

Note: To determine the estimated percentages in this table, we included the total number of times patent examiners identified a particular retention incentive and flexibility as one of the three most important reasons they would choose to stay at USPTO. Percentages total more than 100 percent because respondents selected three reasons each.

**Appendix II: Selected Survey
Results**

Q12. Looking at the list of reasons in question 10, what are the top three reasons that would cause you to consider leaving USPTO?

Reason	Estimated percentage
a. Your current total pay (excluding benefits)	16
b. Your current federal benefits	4
c. The availability of monetary awards	6
d. The recent implementation of a special pay rate increase	1
e. The caliber of your current supervision	13
f. The extent to which resources, such as mentors, are available to answer your questions	8
g. Your opportunities for career advancement	15
h. Your ability to be promoted to the next GS level	8
i. The extent to which this job fits your work style	11
j. Your production goals	67
k. The amount of paid leave that you must use to meet production goals	37
l. The amount of voluntary/uncompensated overtime that you must work to meet production goals	59
m. The amount of review of your work (i.e., for quality purposes)	26
n. Activities offered by the Work-Life Committee (e.g., 4 on 4 basketball tournament, trip to Atlantic City, but NOT activities run by the PTO Society or your Technology and/or Art Center)	1
o. The availability of the law school tuition program	1
p. The availability of a hoteling program (i.e., the opportunity for examiners to work full-time from an off-site location)	2
q. The availability of a teleworking program (i.e., the opportunity for examiners to work some hours from an off-site location)	1
r. The availability of the flexible work schedule program	2
s. The availability of flexible spending accounts (i.e., the program that allows you to pay for eligible out-of-pocket health care and dependent care expenses with pretax dollars)	0
t. The availability of a transit subsidy program	0
u. The availability of an on-site health unit	0
v. The casual dress policy	1
w. The availability of on-site child care	0
x. Access to an on-site fitness center	0
y. Other—Please specify below	7

Source: GAO survey.

Note: To determine the estimated percentages in this table, we included the total number of times patent examiners identified a particular retention incentive and flexibility as one of the three most important reasons they would choose to leave USPTO. Percentages total more than 100 percent because respondents selected three reasons each.

Appendix III: Comments from the Department of Commerce

DEPARTMENT OF COMMERCE

August 15, 2007

Ms. Anu K. Mittal
Page 2

- Applicant Quality Submissions, which if pursued, will require most applicants to provide the USPTO with an applicant quality submission and written analysis to assist the examiner in the examination of the application.

In general, the USPTO agrees with GAO's assessment of the challenges facing it and GAO's conclusion that hiring efforts alone are not sufficient to reduce the patent application backlog. The above initiatives being implemented and those under consideration by the USPTO will result in a more efficient and focused examination on the part of the patent examiner. It is anticipated that there will be efficiencies gained from these initiatives. Once the USPTO determines the effect of these initiatives on examiner productivity, we will reevaluate the assumptions that we use to establish examiner production goals.

I enclose a list of specific technical comments that clarify and/or correct certain points covered in your report.

Many thanks to Michelle Triestman and Vondalee Hunt who spent many hours reviewing survey data and talking to USPTO employees. I also extend my appreciation to you and your team for your dedication to the highest standards of professionalism in preparing the draft report.

Sincerely,



David A. Sampson

Enclosure

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Anu K. Mittal, (202) 512-3841

Staff Acknowledgments

In addition to the contact named above, Vondalee R. Hunt (Assistant Director), Nancy Crothers, Nancy Hess, Stuart Kaufman, Grant Mallie, Rebecca Shea, Michelle K. Treistman, Lisa Vojta, and Greg Wilmoth made significant contributions to this report. Scott Derrick and Omari Norman also contributed to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Susan Becker, Acting Manager, Beckers@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548